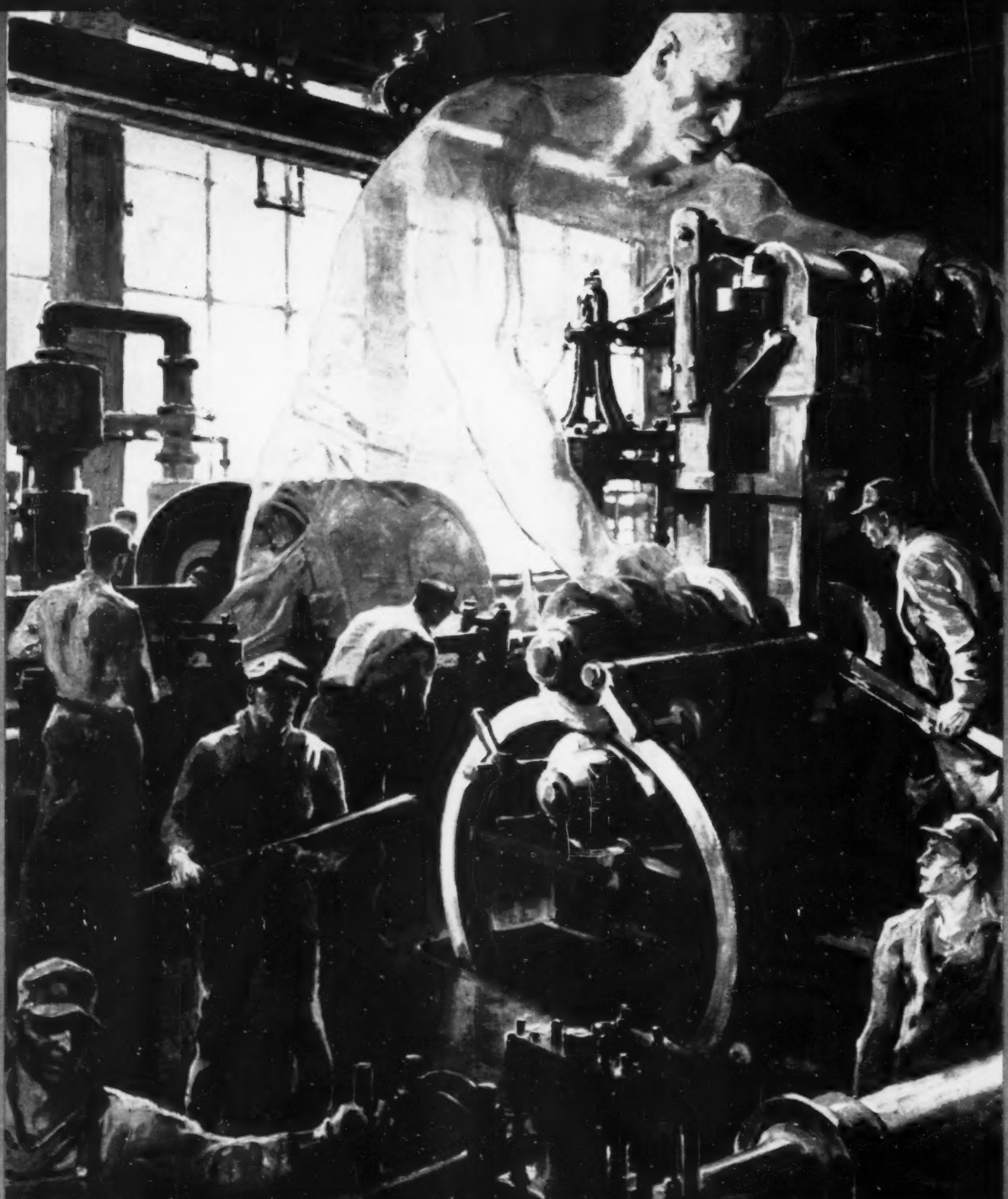
NLGI Spokesman

Journal of National Lubricating Grease Institute

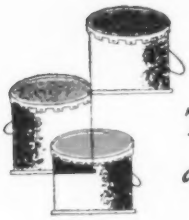


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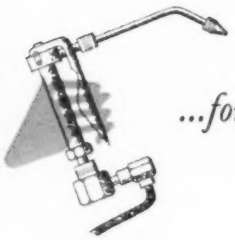
They produce greases of any desired consistency



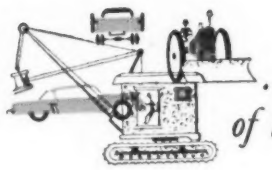
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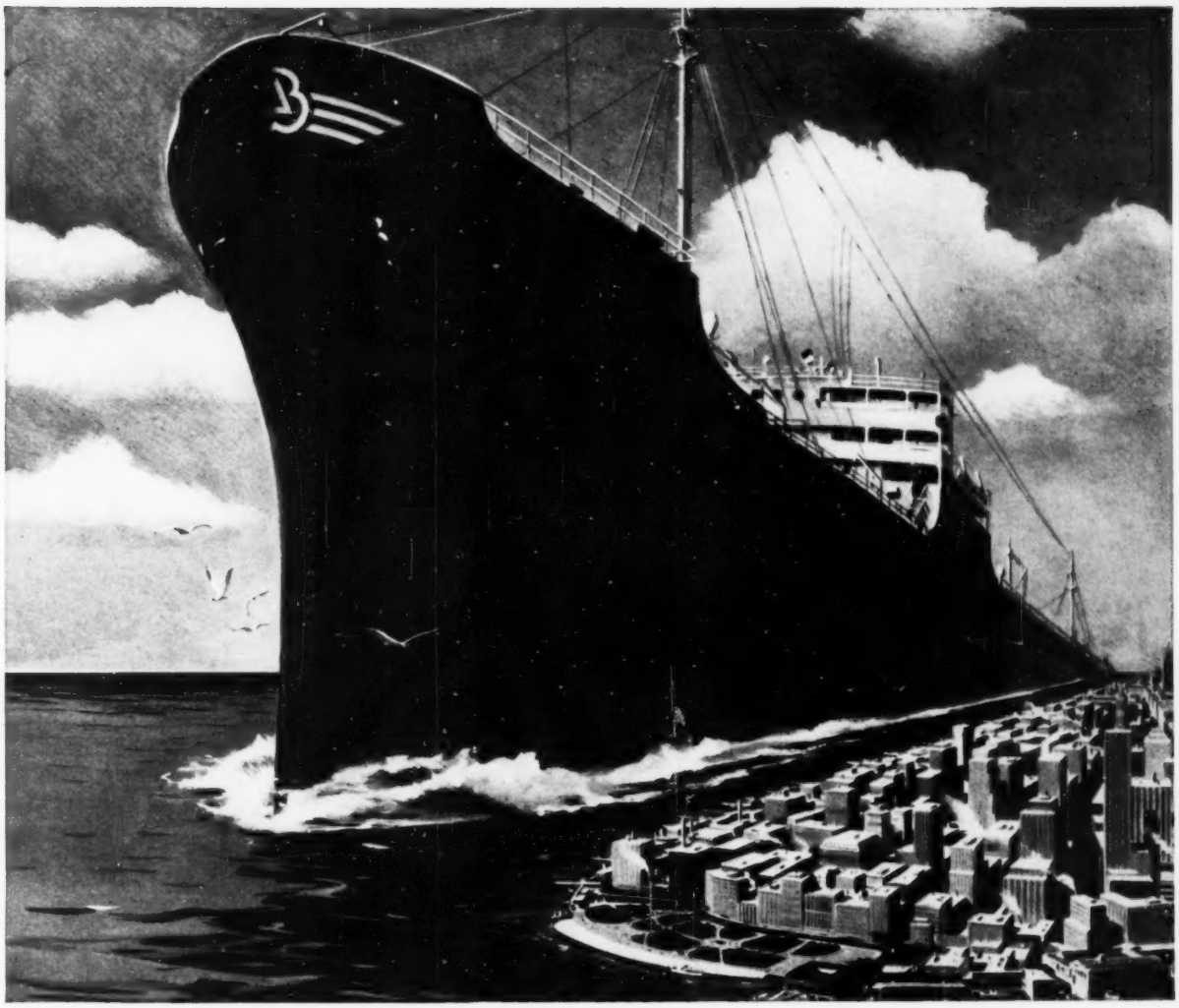
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Cities Service is proud to be a top member on the team of the American petroleum industry . . . today doing the greatest job in its history under handicaps greater than ever before.

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An important part of the American Oil Scene

BENTONE* GREASES WON'T MELT

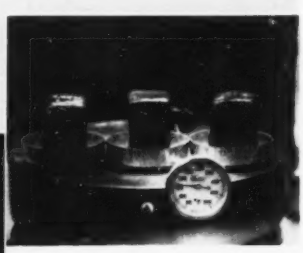
THE picture story shown below demonstrates why multi-purpose Bentone* greases have proved superior to conventional greases in high temperature service. A grease compounded with Bentone 34, a non-soap high-efficiency gelling agent, was heated between two ordinary soap base greases. While the gel structure of the two soap greases broke down as the temperature increased, the thermal stability of the Bentone grease can be seen at even 500°

Although the temperature at which Bentone greases will ignite is set by the fire point of the oil (as in the case of conventional greases), Bentone 34 greases, when properly compounded *will not melt*, even while burning.

Write today for your free copy of the new Bentone 34 brochure, filled with complete information about the many advantages of this non-soap gelling agent.

* TRADE MARKS REGISTERED U. S. PATENT OFFICE



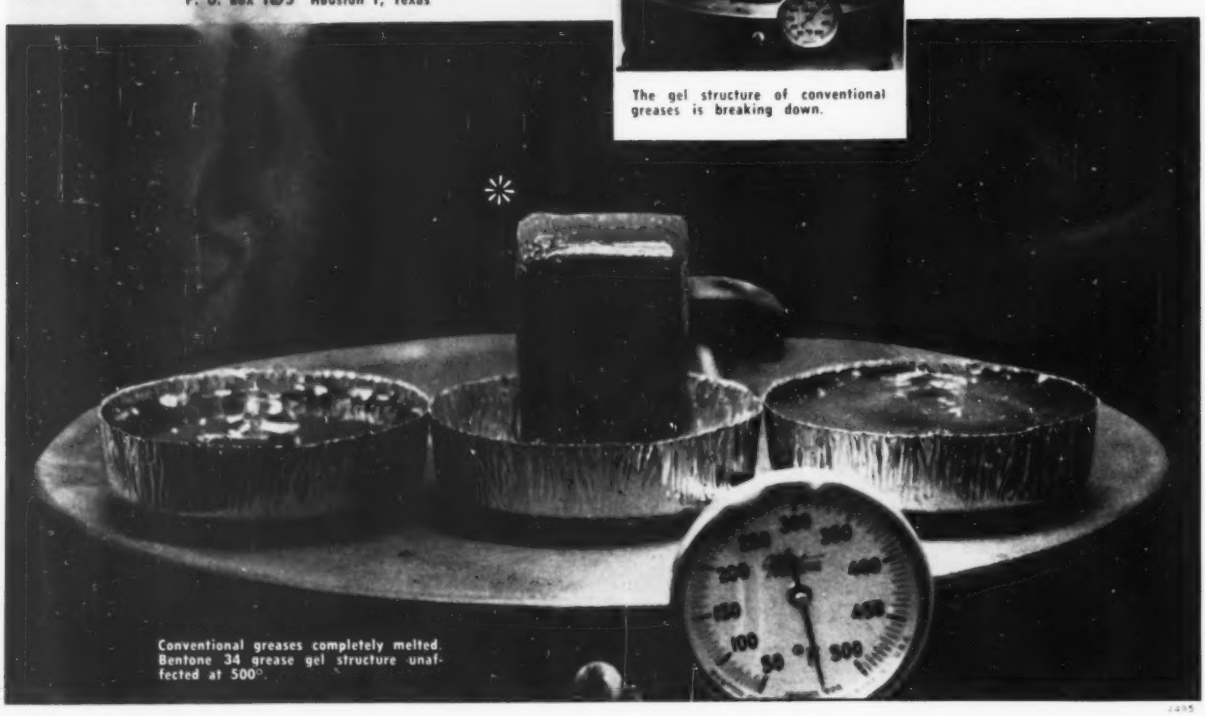


Bentone 34 grease, center, between two conventional soap base greases.



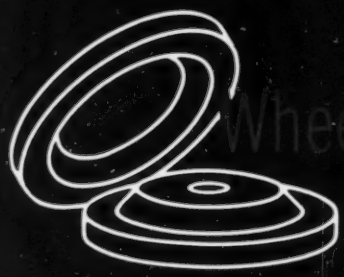
The gel structure of conventional greases is breaking down.

NATIONAL LEAD COMPANY • BAROID SALES DIVISION
P. O. Box 1675 Houston 1, Texas



Conventional greases completely melted. Bentone 34 grease gel structure unaffected at 500°.

Wheels and Stones That Turn



Since man first began to develop and use his reasoning processes he has recognized the fact that there existed a thing which we call friction.

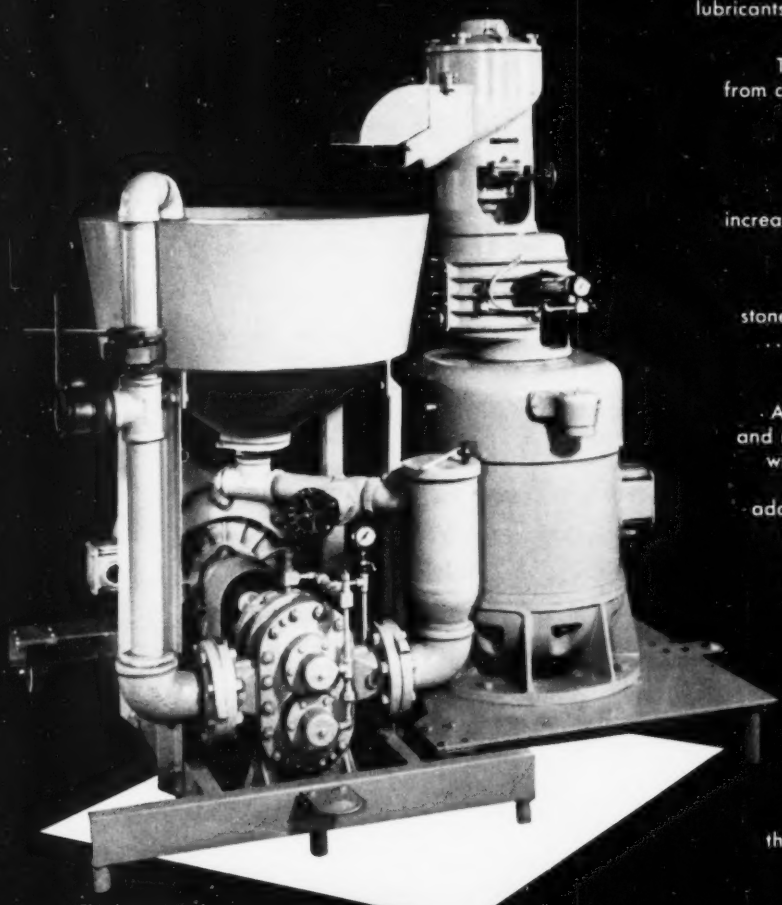
And the development of the wheel brought about the problem of lubrication. Historically, lubricants are believed to have been in use over 7000 years.

But the wheels turned faster and faster. Transition was made from slow speed to high speed, from crudity to precision, from man-power to mechanical power, and from spasmodic hand lubrication to automatic application of an ever-increasing number of highly specialized greases.

With these developments came ever-increasing demands for higher quality, better uniformity, and greater homogeneity. Morehouse engineers . . . looking for a solution . . . followed the same development pattern. They developed high-speed stone milling to a high degree of perfection. The stones . . . operating in a horizontal plane in the Morehouse Mills . . . went faster and faster, reaching their present high-production speed of 5400 R.P.M. And, turning back to friction to make it the servant and not the master, Morehouse engineers collaborated with The Carborundum Company to develop specific stones for specific products. Finally, Morehouse added accurate adjustment of stone separation . . . in 1/1000's of an inch up to 1/8 inch . . . to obtain the exact degree of homogenization, emulsification, disintegration, dispersion, blending, or grinding desired for each particular lubrication product.

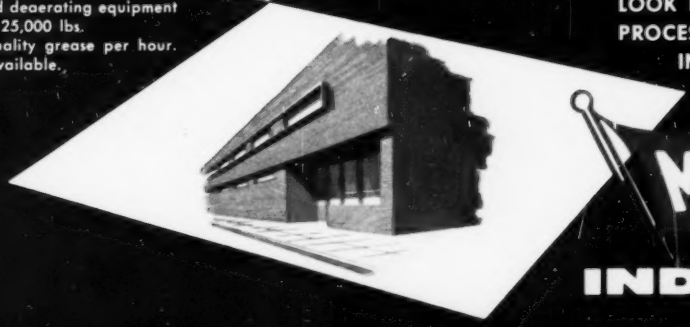
A closely allied problem, deaeration, was met head on and solved. Today you benefit from the combined Morehouse milling and deaeration equipment. It is portable and easy to move about. It gives you the answer to many of your today's problems . . . higher quality, better uniformity, greater homogeneity.

Thus the turning wheels have evolved the turning stones . . . the stones in Morehouse Mills. May we help you?



This large Morehouse grease milling and deaerating equipment produces up to 25,000 lbs. of high quality grease per hour. Smaller units available.

LOOK FOR THIS PENNANT ON GREASE PROCESSING EQUIPMENT . . . IT IS YOUR INDICATION OF LEADERSHIP



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President's page

by W. Wayne Albright, President, N L G I

TELLING IS SELLING



In the final analysis, both manufacturers and marketers of lubricating greases have to supply suitable products for lubricating grease users. About the only way suppliers have of learning how effectively they are satisfying their customers' needs (aside from watching sales figures) is to find out how their lubricating greases are being used and how good a job they are doing.

This fact points out the importance of communication between the producer and consumer. Helping to provide that communication is one of our important NLGI objectives. Our group and its activities furnish a common meeting place for the exchange of ideas.

Communication is, of course, a two-way street. It is important for the lubricating grease manufacturer to furnish the consumer with complete information about his products and how they should be used. The relationship of communication to selling is obvious.

Our medium for exchange of information is the NLGI Spokesman. From its pages, manufacturers and marketers learn, for example, about the results of performance tests conducted with the users' equipment and can use these results for the improvement of their products. Plant owners can learn about new lubricating greases and about better ways to make use of them.

Producers and users alike have read in our NLGI Spokesman about the potentialities of grease lubrication, about recent advances in grease research, proper grease handling methods, lubricating grease engineering service, test methods and about developments in lubricating grease packages and dispensing equipment. It is the exchange of this sort of information that furthers our NLGI communication objective (and, perhaps, our members' sales).

NLGI members, by participating in this "telling" job can certainly expect to increase their effectiveness in their selling job.

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NLGI Spokesman

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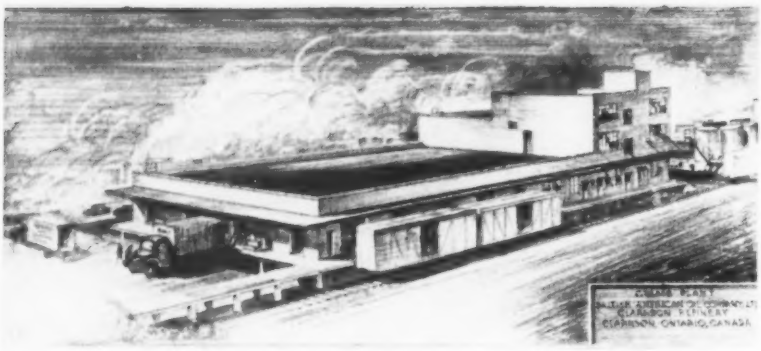
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ABOUT THE COVER

FRICTION — Our cover page illustrations usually come from an artist's drawing board, or a photograph. This month's cover came from a painting on the conference room wall in the office of H. P. Hobart, NLGI Director and Vice-President of Gulf Oil Corporation.

It was quite some years ago that we saw it for the first time and admired both subject and the superb way the artist illustrated the restraining force of friction.

Looking about for a suitable subject for the September cover page, we asked Director Hobart if a reproduction could be furnished. A copy was immediately forthcoming and is reproduced on this month's cover. It's so outstanding we're having it framed and hung in the most conspicuous position in the Institute Office.



BRITISH AMERICAN STARTS MANUFACTURING OWN GREASE AT CLARKSON

R. O. RINEARSON
The British American Oil Company, Ltd.
Clarkson, Ontario, Canada

C. W. NOFSINGER
The C. W. Nofsinger Company
Kansas City, Missouri

"Most modern grease plant on the American continent" starts operation.

This comment was made by an old-timer well know in the grease business, after looking over British American's new Grease Plant at its Clarkson Refinery near Toronto, Canada. This new 15-million lb. year grease plant started operation in April and produced several hundred thousand pounds of grease in its first two weeks' operation. The indications are that the plant will easily attain its rated capacity when operating 8 hrs. day, five days week. The cost of the plant was approximately $1,500,000.

The C. W. Nofsinger Company of Kansas City, Missouri, was in charge of the engineering design, N. A. Armstrong of Toronto designed the building, British American carried out purchasing and expediting as well as the off-site work, while Pigott Construction Company of Toronto was the general contractor. These forces have combined to provide the company with a plant which represents the last word in complete grease manufacturing and handling facilities and is capable of producing a full range of greases of consistently high quality and uniformity. Production from the plant will supplant the products formerly purchased by the company to supply its market for solid lubricants. Raw materials to be processed in the new plant will be almost entirely of Canadian origin. The petroleum oils being used are naphthenic lube oils from the company's Montreal East refinery and paraffinic lube oils from the Clarkson refinery. The finished grease will be distributed throughout Canada.

The principal types of greases for which the facilities were designed to manufacture include calcium greases, sodium greases, lithium greases, barium greases, mixed-base greases and non-soap greases. Raw materials required for the operation of the plant include a full range of fats and fatty acids, both saturated and unsaturated. The different basic ingredients involved in the saponification processes are purchased to rigid specifications to ensure the highest quality of soap. The mineral oils include a wide range of viscosities and types.

Unique features of this plant include:

Centralized Control of Operations

Weighing of all Ingredients Used in Grease Making

Hot Oil Heating and Cold Oil Cooling of Kettle Equipment

Pressure-Vacuum Contactors and Kettles

High Capacity Mill and Dehydrator-Deaerator

The building, of concrete block construction, covers an area approximately 100 feet by 240 feet. That part of the building which houses the storage tanks, contactor, kettles, pilot plant, laboratory and other process and utilities equipment, is three stories high, while the section occupied by the filling lines, warehouse and shipping departments is of single story construction. The plant is located alongside a railway spur line and a covered loading platform extends the entire length of the building to facilitate the handling of incoming and outgoing materials. Provision is also made for shipping by truck transport.

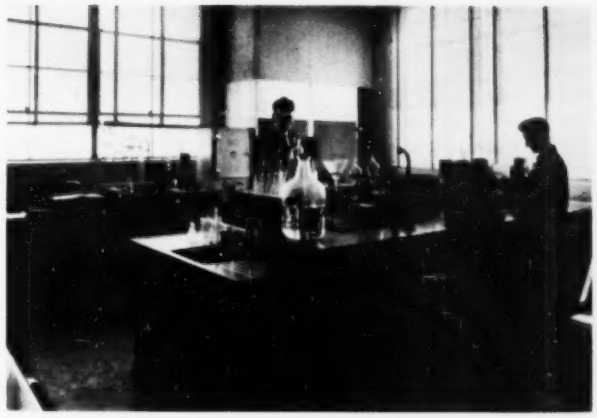
The grease manufacturing equipment is distributed over three floors. The third floor houses principally the weigh tanks from which charge stocks flow by gravity to

the floor below. The second floor is the site of several important operations. The furnace and the oil circulation pumps are located here. The centralized control board on this floor makes for convenient operation of the entire grease-making process. In order to facilitate the checking of ingredients and formulations, the grease testing and pilot plant rooms are located here in close proximity to the manufacturing area. The second floor also has storage space for a current supply of dry chemicals. On the first floor are located storage and other tanks, charge stock pumps, and grease finishing and packaging equipment. Here also are the offices and a pressurized electrical control room. Empty and filled container storage space is located in an adjoining single story section of the building.

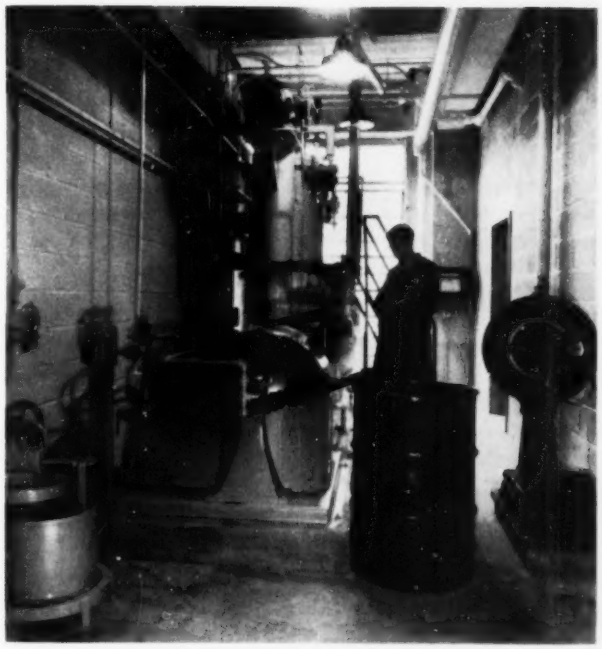
Both indoor and outdoor storage facilities are provided. Oil and tallow may be unloaded from tank cars by a pump provided for this purpose at the unloading rack. The oils may also be brought from the refinery lube oil storage tanks. Five outside storage tanks are provided for miscellaneous lube oil stocks. Each of these has a built-in suction steam heater and is serviced by its individual reversible pump. It is possible, by means of flexible hose and couplings, to pump from any tank, either indoors or out, into any other tank.

Indoors, oils are stored in six tanks and are maintained at above room temperature by means of individual suction-type steam heaters built into the tanks. The fatty acid and tallow storage tanks are insulated and have side entering mixers. These materials are maintained at 120° to 150° F. by means of steam heating coils on the outside of the conical bottoms of the tanks. Adequate temperature controls and indicators are provided for each inside tank and heater. Each tank is serviced by an individual pump for pumping out and for recirculation through the heaters.

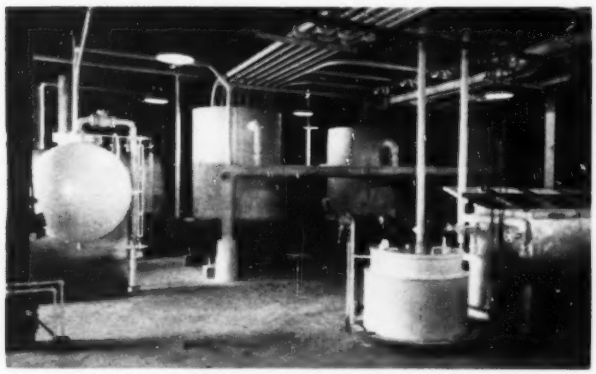
The flow of process materials from storage to weigh tanks is controlled from the instrument board by means of hand control valves. In addition to the scale dials at the equipment, remote dials are provided within viewing distance of the control panel so that weighing can be done by the operator at the panel. The piping at the weigh tanks is arranged so that the process materials can be re-



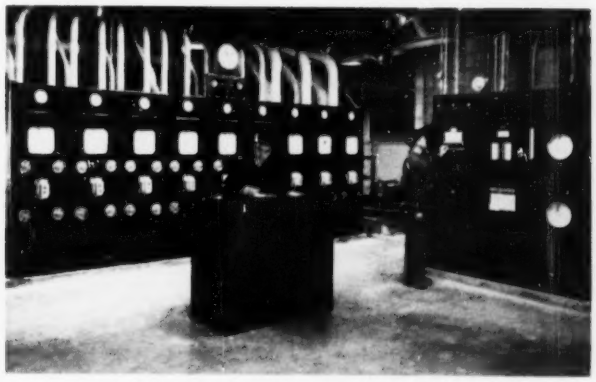
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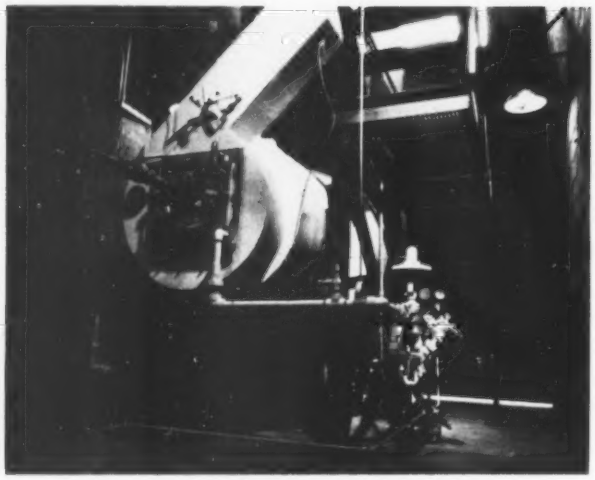
PILOT PLANT



WEIGH TANK AREA



CONTROL BOARD



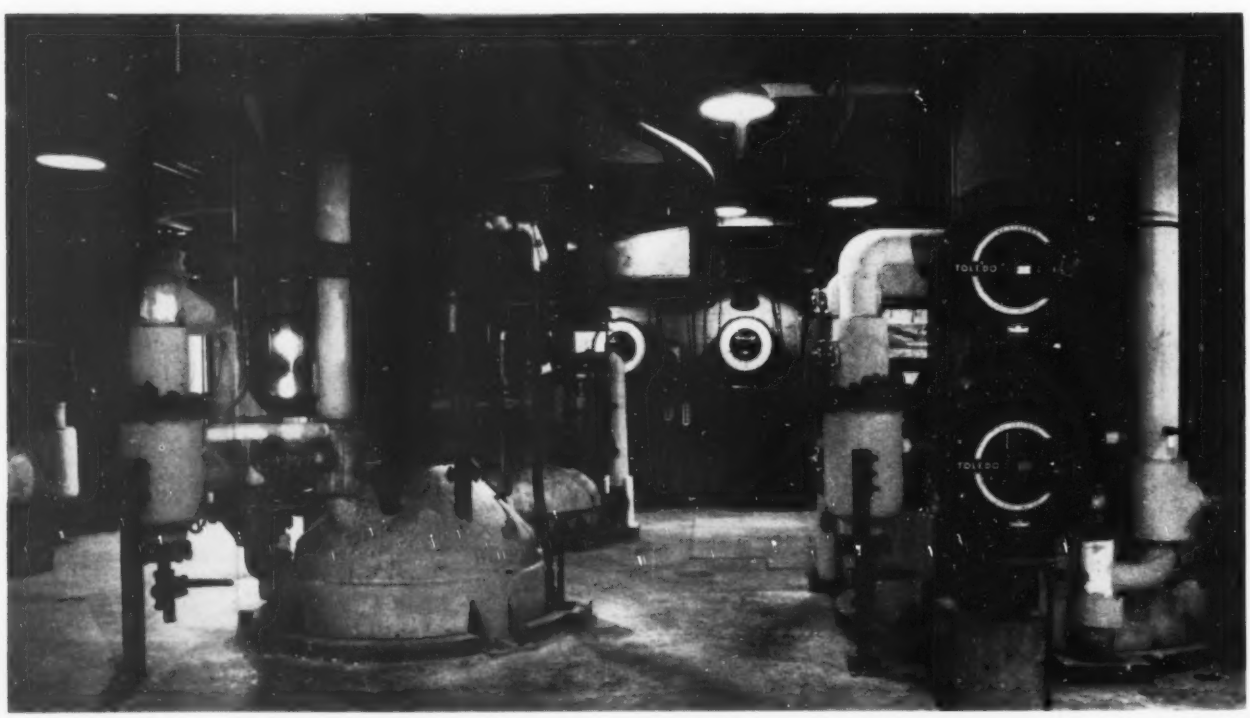
FURNACE

turned to storage if necessary. Each tank is provided with a high level signal and alarm and emergency overflow to a tank provided for this service. The tallow weigh tanks are wrapped with outside steam coils while the two weigh tanks for oil have coils on the outside of the cone bottom only.

The furnace is gas fired and is automatically controlled with necessary safety features. The oil circulation rate through this furnace is 1500 gpm. The furnace is unique in that transfer rates of 40- to 50,000 Btu/hr./sq. ft. are easily maintained over a period of many years. Since no deposits form on heating surfaces, maintenance is at an exceedingly low level. Thermal efficiency exceeds 80 per cent.

Several sizes and types of reaction kettles are provided for the sake of flexibility with respect to both quantity and type of grease to be manufactured. The 15,000-pound and 8000-pound kettles may operate under vacuum or at pressures up to 150 psig, whereas the 12,000-pound kettle has a flat top and is for operation only at atmospheric pressure. All of these kettles have jackets through which heating oil and, on occasion, cooling oil may be pumped. Two smaller kettles, one of which is jacketed, are for the manufacture of cold sett greases. Still another small kettle is used for melting tallow and other compounds and can also serve as a rundown tank. The 6000-pound contactor is common to all these kettles. It is used primarily for carrying out the saponification reaction, but it may also be used for the dispersion of soap into the oil when required. All kettles are equipped with mixers, whereas mixing in the contactor is by means of a high circulation impeller in the center of a circulating tube located at the bottom of the vessel.

When a batch of grease is finished, it is pumped from kettle through a colloid mill. The pump is specially designed to maintain the pressures required in the handling of the different grades of grease. The purpose of the mill is to bring about homogeneity of product and to improve the mechanical and storage characteristics of the lubricant. From the mill, the grease passes to the dehydrator-deaerator. This equipment, again of special design for this plant, operates under vacuum to remove entrained air and any undesired moisture. Removal of the air increases the oxidation resistance of the grease and allows the product to assume the normal color of the oils used. When the grease leaves the deaerator it is pumped to one of the three conveyor line filling stations.



KETTLE MANUFACTURING AREA

grease manufacturers

FOR
RESISTANCE TO OXIDATION
CONTROLLED END PRODUCT
LIGHT COLOR
UNIFORMITY

INSIST ON A. GROSS FATTY ACIDS

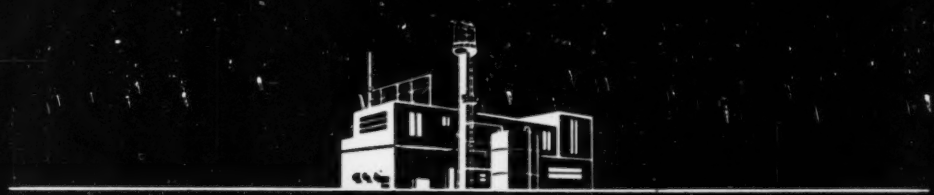
GROCO 8 . . . RED OIL

Titre	8° C.—10° C.
Cloud Point	46° F.—49° F.
Color Lovibond 1" Red	3—6
Color Lovibond 1" Yellow	15—30
Unsaponifiable	1.5% max.
Saponification Value	197—200
Acid Value	196—199
% F.F.A. as Oleic Acid	98.5—100
Iodine Value (WIJS)	88-93
Refractive Index 50° C. (Average)	1.4495

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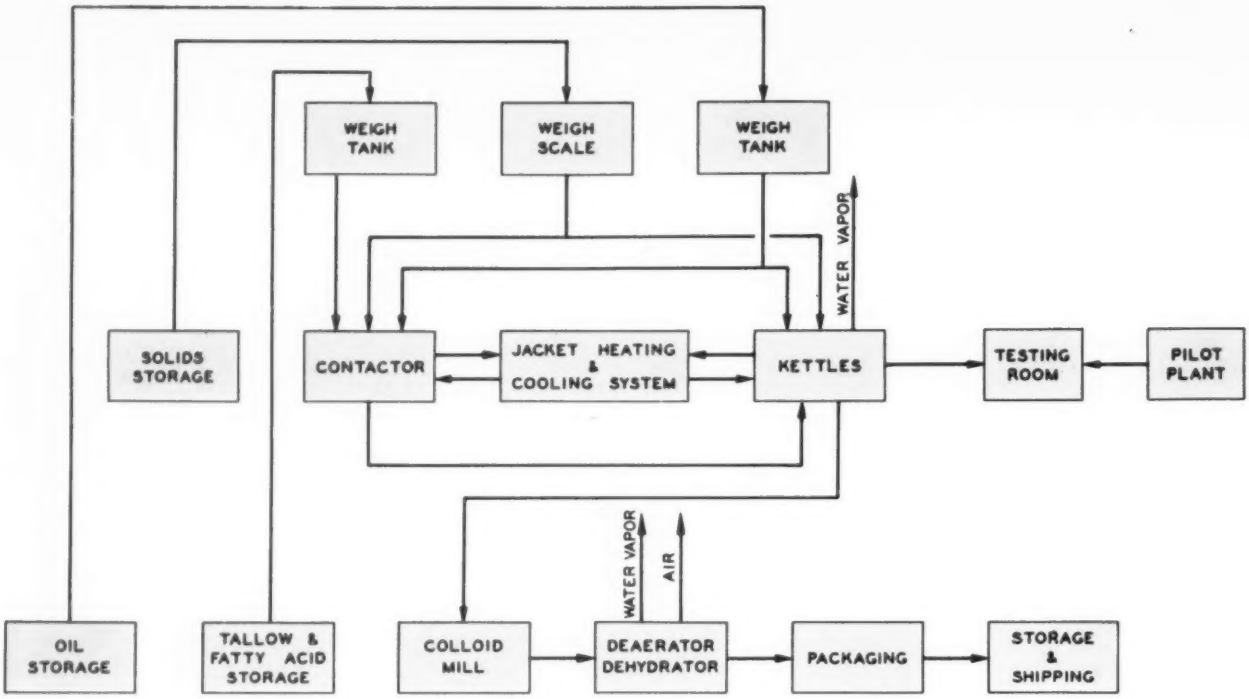


FIGURE I. BLOCK FLOW DIAGRAM

The grease, in all cases, is drawn from the kettles at the first floor level and may be passed through grease mill and dehydration equipment or directly to packaging as desired. This finishing equipment is of high capacity, i.e., 800 to 1000 lb. per minute.

Packaging of 100-lb. kegs, 25-lb. pails, 10-lb. and 5-lb. cans is done automatically. Drums of 400-lb. capacity and the kegs are filled at the maximum rate which can be handled by the finishing equipment. Containers such as the 25- to 35-lb. are filled at the rate of 15 per minute and 10- and 5-lb. cans at a rate of 30 to 60 per minute.

Full use is made of conveyor systems. Conveyors have been arranged for unloading the empty containers from freight cars to the empty container storage area, located adjacent to the packaging area. Another conveyor brings the empty containers to the packaging area where they are filled, weighed and stenciled. The filled containers are loaded onto pallets which are taken by a gasoline driven fork truck to the storage area. Space is provided to store 500,000 pounds of grease in containers which hold 5, 10, 25, 100 and 400 pounds, respectively.

The actual grease making operation may be described briefly as follows (See figure 1):

The contactor is charged with the required amount of fat or fatty acid and heated to 200° F. in less than ten minutes. When this temperature is reached, the alkaline dry solids which have been weighed during the heating process are also charged to the contactor and the vapor outlet valve closed. The temperature is then raised rapidly to 350°-400° F. The pressure is then about 70 psig. When this temperature is reached, the soap is flushed into the finishing kettle, which has already been partially filled with oil and heated to about 200° F.; the quantity of this oil is generally sufficient to bring the kettle contents to 40 per cent of the final volume. The batch is in some cases then heated again to 350-400° F. During this operation a large part of the water will be vented off. When closed kettles are used, the pressure is reduced gradually and eventually a vacuum may be applied by means of a steam jet ejector in order to reduce the water content to the required amount.

At the end of this operation, the remaining oil is charged to the kettle at a temperature sufficient to reduce the overall batch temperature to the proper packaging or milling temperature which ranges from 150° to 250° F. In some cases, it is necessary to circulate cooling oil through the kettle jacket. Facilities are provided for this purpose. The grease is circulated for ten minutes longer to produce a uniform product. Then it is pumped from the kettle through the mill where it is homogenized, then through the deaerator where air and moisture are removed to the desired extent before packaging.

The cycle for sodium grease as described above, usually takes slightly less than two hours and is sufficient for the 15,000-pound kettle operation when the grease is packaged in large containers. Of this time, the contactor is used slightly less than one hour for the batch. To make the desired production rate of 60,000 pounds per day, it is necessary to make less than two full batches per day in each of the three main kettles. The contactor will be in

Insure the good reputation of *your* products!!

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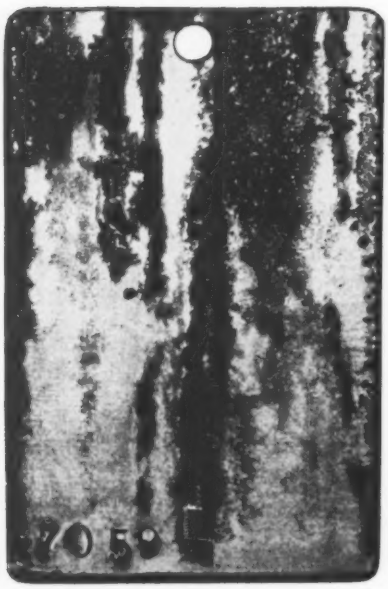
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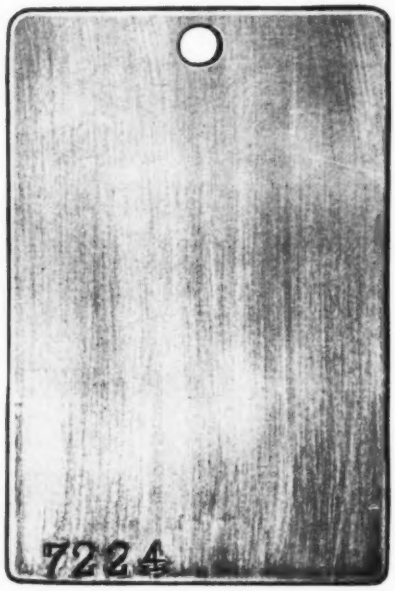
defies rust, corrosion, and damage from salt spray



Rust marks show that grease "A" failed to protect this test panel.



Grease "B" did not prevent this serious rusting and pitting in 1,000 hours.



But Metasap Aluminum Stearate Base grease completely protected this panel

FARM machinery takes some awful punishment from the weather. Especially in salty air along seacoast areas. Probably no more taxing service could be found for a protective lubricant. Yet, a leading nationally-known grease maker found by test how to defend farm machinery from even the most grueling weather conditions.

After coating testing panels with grease based on Metasap Aluminum Stearate and keeping them in humidity and salt spray cabinets for 1,000 hours, he says results convinced him that such a grease is "*head and shoulders above other greases.*"

Not only do Metasap Aluminum Stearate greases provide a top-notch protective agent for farm machinery anywhere, but such greases have proved equally superior for tough lubricating jobs in many other arduous services.

Metasap Aluminum Stearate Bases can probably solve a difficult lubricating problem for you. We'll be glad to help you select the correct base for any given oil, to meet your needs. Or achieve any desired effect in a finished grease, through use of proper soap mixtures.

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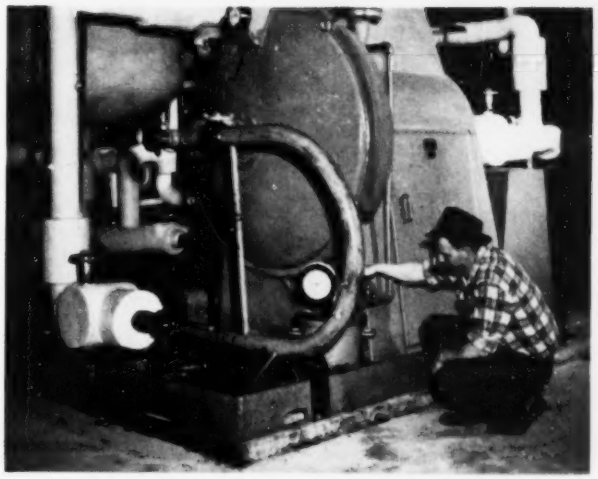
operation as required to produce the soap and to disperse soap and oil when desired. For the production of certain special greases, the contactor may occasionally not be used.

Heating of the kettles and the contactor is by means of hot oil at 450-500° F. pumped through each vessel jacket at rates of 200 to 300 gpm. The oil furnace has a small radiant section, a tubular convection section and an air preheater.

The hot oil circulating pump sends the jacket oil through the furnace and into a surge drum. From there the jacket oil pump sends the oil to the heating jackets from which it returns to the surge drum.

The control panels, conveniently located on the second floor, adjacent to the contactor, kettles and inside storage tanks, are equipped with nine recording temperature controllers. These instruments allow the operator to control remotely the temperatures of liquid fats and oils when being charged through weigh tanks to any one of the kettles or the contactor. An additional recording temperature controller gives automatic control of the temperature of the circulating heating oil. Temperatures throughout various sections of the process may be checked by means of a conventional multipoint potentiometer while the kettle and contactor temperatures can be observed on a four point recorder. Instrumentation of this type, where temperature records are available for each batch of grease, results in economy of operation as well as uniformity of product.

The grease plant is almost completely self sufficient with respect to laboratory services. The laboratory within the grease plant building is fully equipped and staffed for control testing and development work. Testing equipment is provided for performing all important tests common to the grease industry. Adjoining the laboratory is



DEAERATOR-DEHYDRATOR

the pilot plant room. The pilot plant is, in reality, a small scale production unit with a capacity of 400 pounds, and is capable of duplicating, on a reduced scale, all operations of the full scale plant. Equipment includes, in addition to the contactor and kettle, a miniature colloid mill and vacuum dehydrator-deaerator. It is possible, therefore, to develop formulations and most efficient process conditions when making use of the pilot plant. Prior to the completion of the grease plant building, the pilot plant was set up in a temporary building and operated for several months to develop the formulations which are now being used in the grease plant proper.

The design of this plant was carried out through the joint efforts of F. A. Davis, R. O. Rinearson and D. E. Caldwell of The British American Oil Company, Ltd., and the Engineering Staff of the C. W. Nofsinger Company.

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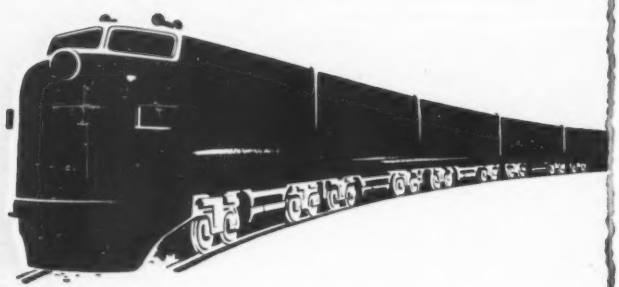
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Technical Committee

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Despite Dr. R. D. Vold's inability to find a qualified student for the NLGI Fellowship at the University of Southern California throughout the past academic year, they have made good progress during the spring and summer and will have a paper to present at the Annual Meeting in October. The paper will be presented under the names of Valeria Elersich, Marjorie J. Vold and Robert D. Vold, and will have the title of "Soap Dispersion and Colloidal Structure in Lubricating Greases." Attention will be centered on the problem of characterization of larger-scale secondary structures, as contrasted with the dimensions of primary fibers, and on the flocculation and deflocculation of fibers to form these structures. Examples will be given and discussed of results obtained by study of electron micrographs of thin sections of a variety of greases and of particle orientation in greases as determined by x-ray diffraction. The current Fellow is Mrs. Valeria Elersich, who has had about ten years of laboratory, library and patent experience. Under Dr. Vold's guidance she is rapidly acquiring a good theoretical background in colloid chemistry and particularly in those branches relating to the structure of gels and the phenomena of flocculation and deflocculation. The aforementioned paper will be presented by Mrs. Elersich. She will also be available for discussions during the NLGI Technical Committee meeting.

1953 NLGI Annual Meeting
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Patents and Developments

Substitution of Liquid Component in Greases

Frequently it is found that a particular liquid vehicle which would be desirable in a grease cannot be milled or homogenized satisfactorily with a particular soap to form a satisfactory grease. Also, it is sometimes found that a manufactured grease satisfactory in grease properties, such as consistency, does not meet specifications, such as wear test, for example. Instead of throwing the grease away, it is possible to recover the soap and the original vehicle for reuse.

In U. S. Patent 2,636,001 issued to Standard Oil Company (Indiana), the liquid vehicle of a grease can be removed without substantially modifying the structure of the expanded soap by extracting the original vehicle with a solvent and then removing the solvent at about the critical temperature of the solvent. Evaporation of a solvent from the soap structure of a grease at atmospheric pressure results in the collapse of the soap because of the cohesive forces exerted by the liquid in the extremely narrow passages within the structure. As the liquid is withdrawn by evaporation, it pulls the walls of the passages together which results in collapse of the structure.

The solvent preferably is extracted with a liquefied normally gaseous hydrocarbon such as ethane, propane, etc., then placed in a pressure bomb containing additional liquefied normally gaseous hydrocarbon and heated to about the critical temperature of the hydrocarbon but below the melting point of the soap. At such temperature, practically all of the hydrocarbon in the bomb will have been transformed from a liquid to a gas and is slowly permitted to escape from the bomb. The porous soap structure remaining functions somewhat like a sponge and it is then possible to introduce into the sponge-like structure any desired liquid vehicle.

In one example, a lithium stearate lubricant grease in the form of a slab was extracted with hexane and the hexane then extracted with propane. The propane-containing block was placed in a pressure bomb containing additional liquid propane and the temperature of the bomb was raised to 210° F., with pressure at 650 psi, under which conditions the propane was permitted to escape slowly as a gas. After all of the propane had escaped, the bomb was found to contain a block of soap having the dimensions of the grease block, and was of very low density and had a white opaque appearance. It was possible to reconstitute the grease or substitute silicone polymer oil or glycerin (with some alcohol as wetting agent) instead of the oil.

Stabilizing Greases Against Oxidation

Higher alkylated, diphenylamine derivates are disclosed in the Sinclair Refining Company patent 2,636,859 as particularly adapted for improving the oxidation stability of greases. Moreover, the use of a small proportion of a dimethylaminomethyl alkylphenol in combination with a higher alkylated diphenylamine is found to be markedly superior to either material alone in imparting oxidation stability to lubricating greases. The ring substituted alkyl groups are high enough in molecular weight to contribute oil solubility. For example, dioctyl diphenylamine or mixed mono-and di-heptyl diphenylamine, appear to cooperate synergistically with 2, 6-di(dimethyl amino methyl)- 4-octylphenol in inhibiting such oxidation deterioration. B. F. Goodrich Co. is claimed to produce the octylated arylakylated diphenylamine.

About 0.05-2% by weight of the diphenylamine and 0.05-2% of the other amine are suggested for use in various greases.

Corrosion Resistant Hydroxy Fatty Acid Greases

Machinery which is lubricated with greases and subjected to intermittent influence of hydrous atmosphere and standing periods is particularly subject to the detrimental influence of static corrosion. In U. S. Patent 2,637,694 issued to Shell Development Company, improved static corrosion resistance in the case of greases gelled with hydroxy fatty acid soaps is claimed to be imparted by use of 1-20% of magnesium hydroxide.

The amount of magnesium hydroxide is claimed to be critical in that amounts less than about 1% are ineffective, while amounts over about 20% unduly soften the grease and cause increased water sensitivity. When dispersed in proper form, magnesium hydroxide imparts a gelling action to the grease, but only when a minor amount of soap is used. As the proportion of soap to the magnesium hydroxide is progressively increased, the gelling action of the magnesium hydroxide becomes increasingly less and eventually reverts to a softening rather than a gelling action. Optimum results are obtained by use of about 0.05-1% of magnesium hydroxide based on the total weight of the grease.

Among the higher hydroxy fatty acid soaps which may be used include hydroxy stearic acids, hydroxy palmitic acids, hydroxy myristic acids, hydroxy behenic acid, 5, 6-dihydroxy stearic acid, 2, 11-dihydroxy palmitic acid, etc. The invention is applicable to soap mixtures containing a minimum of 35% lithium hydroxy fatty acid soaps, although the claims generally specify 5-25% of soap.

Calcium-Sodium Soap Greases from Highly Oxidized Waxes

Ordinarily, methods mostly used for incorporating oxidized products in greases separate the saponifiable matter by solvent extraction or the like. In order to avoid this expensive separation step, it has been proposed to use the entire oxidation product for greases. However, such products have a tendency to separate and harden on storage due to the large proportion of wax like unsaponifiable matter.

In the U. S. Patent 2,637,695, The Texas Company proposes the production of a premium multi-duty lubricating grease, based on relatively inexpensive and readily

obtainable materials, employing a mixed calcium-sodium base soap prepared from a highly oxidized fraction of petroleum wax as the source of saponifiable material. Suitable oxidized wax fractions for these soaps have neutralization numbers of 100-300 and saponification numbers of 175-450. They are preferably acid-like rather than ester-like in character. The crude oxidates may be saponified directly to form the mixed Ca-Na base soaps for use in grease, or they may be water washed or acid treated first to remove undesirable fractions.

The improved properties of these greases are based primarily on the fact that they combine, in a single grease, higher dropping points (about 500°F.+) than can be obtained from an equivalent soap content of the conventional sodium soap greases of natural fats, and essentially equivalent water resistance to the straight calcium soap water-stabilized greases which have dropping points of only about 210°F. In addition, they are claimed to have a smooth texture, good shear resistance upon working, good high and low temperature properties, and show low leakage from bearings.

The oxidates are produced by oxidizing crude or refined wax, slack wax or petroleum at 230-330°F. at up to 300 psi or more, with air rates of 15-60 cf/hr/lb charge. The oxidation is continued for a sufficient period to obtain the desired degree of oxidation. With this high degree of oxidation, it is believed that hydroxy acids are largely present. About 10-40% of the mixed Ca-Na soap is used, the proportion of sodium soap being at least 40% by weight. Preferably, the ratio of Ca:Na soaps is in the range of 25:75 to 60:40.

Grease Containing Complex Ester Base and Sodium Myristate

A wide temperature range ball and roller bearing grease in which the oil component is a complex polyester of the type obtained by esterifying a dicarboxylic acid with a monohydric alcohol, thickened with sodium myristate, is disclosed in U. S. Patent 2,639,266 issued to The Texas Company.

The oil base may be prepared by heating together under reflux a mixture of dipropylene glycol, sebacic acid and 2-ethylhexanol in a 1:2:2 mol proportion with benzene solvent and about 0.5% sulfuric acid catalyst. The reaction is continued until an amount of water equivalent to a mol proportion of 4, with reference to the weight of reactants, is collected and the neutralization number of the product is zero. The mixture is neutralized with bicarbonate and distilled under vacuum.

The sodium myristate thickener is added in amount of 15-25%, together with other possible additives, such as tricresyl phosphate, in sufficient amount to act as the vehicle. About 1% N, N' diphenyl p-phenylene diamine in tricresyl phosphate solution may be added.

This grease is claimed to be superior for lubricating small, light, high speed bearings, such as those in aircraft gyroscopes.

News Items

Basic properties of lubricating greases–Boner (Machine Design 5-53 p. 129).

Thixotropy of lubricating greases–simple worker–penetrometer test-Hotten et al (Amer. Soc. Testing Mat. 4-53 p. 53).

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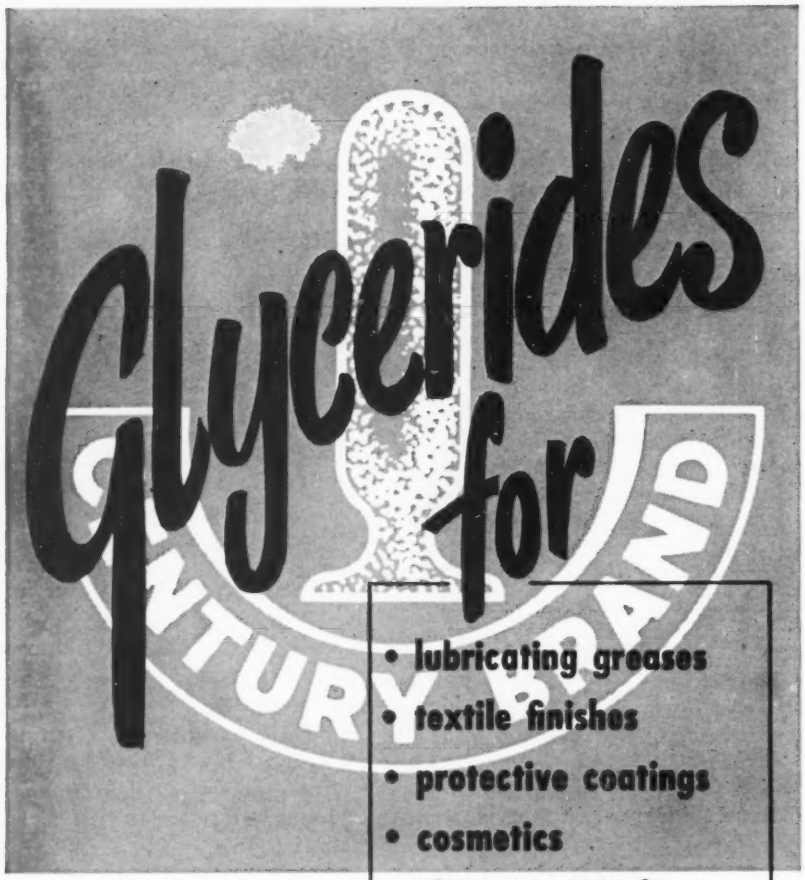
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F.F.A. (as Oleic Acid)	2.0 max.
Acid Number	4.0
Saponification Number	176-184
Iodine Value (WIJS)	1-5
Melting Point (°C)	82-85
Hydroxyl Value	155-165
Acetyl Value	137-148

CENTURY HYDREX 360 *(hydrogenated tallow glyceride)*

This hardened tallow product is available in beads and its good color, high titre and low iodine value particularly suit it for use in certain textile finishes and lubricating greases.

SPECIFICATIONS

Titre	(136.4-140.0°F) 58-60.0°C
Iodine Value (WIJS)	1-3
Free Fatty Acid	1-3%
Acid Number	2-6
Saponification Value	190-195
Color 5¼" Lovibond Column (Max.)	15 Yellow-2 Red

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James Ralph Corbett



James Ralph Corbett was a native of Cincinnati, Ohio, where he entered the oil and grease business at a very young age. Before reaching his twentieth birthday he had rolled up a number of years of service with the Moore Oil Company, now a unit of Pure Oil Company, and found himself in a position of responsibility with many men working under him. During this time, Mr. Corbett was acquiring his education—working during the day and studying at night in the small chemistry laboratory which he had set up in the attic of his home.

After serving a number of years with Moore, and with his hard-earned degree in chemistry tucked under his belt, Mr. Corbett moved from the Cincinnati area to Oklahoma, where he spent another decade with several oil companies in every phase of the lubricating grease business, including that of production manager.

In 1922, he and his family moved to Oklahoma City, where he joined with H. L. Cato and Claude C. Huffman to form the Cato Oil and Grease Company. The plant was located in Oklahoma City because of their desire to be near adequate supplies of high grade raw materials and to be in a position to serve the ever expanding Midwestern market for oils and greases. The original plant covered only two city lots and manufactured cup grease, based on a single formula and using one small grease kettle. Today, the Cato Oil and Grease Company has expanded to more than eleven acres with manufacturing facilities for 150,000 pounds of grease and 50,000 gallons of oil daily. During his early years in the founding of this business, Mr. Corbett served as vice-president in charge of plant production and his vast experience in engineering quality products was a dominant factor in the progress of the company. When H. L. Cato died in 1948, the active management of the business was shared by the two surviving partners, Mr. Corbett and Mr. Huffman, at which time Mr. Corbett became president of the company and served this business, which he loved so much, in this capacity up until the time of his passing.

Mr. Corbett was a past president and had for many years, as you know, been a director of the National Lubricating Grease Institute. He was also a director of the Pennsylvania Grade Crude Oil Association, a member of the Society of Automotive Engineers and of the American Society of Lubrication Engineers.

In addition to his achievements in the lubrication industry, Ralph Corbett's many friends will remember him for his active participation in civic affairs, for his untiring efforts and sincere love in working with the young people and his church.

The Cato Oil and Grease Company will always stand as a proud monument to the ambitions, hopes, and tireless efforts to which Mr. Corbett devoted his life. It was his express desire that all of his friends remember him as they knew him: Vigorous, active and working. There is little more that we can say at a time like this; we can only point with pride to his many achievements and know that his life was devoted to the three things most dear to his heart: His family, his church and his business.

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PEOPLE in the Industry

C. O. Martin Will Handle Attapulgus Gelling Agent



C. O. MARTIN

Attapulgus Minerals & Chemicals Corporation has announced the assignment of C. O. Martin to sales and technical service activities in connection with Permagel, the company's new thickening agent for organic and aqueous media.

Mr. Martin brings with him unique qualifications for his new duties. He has been closely associated for the last five years with laboratory development and application research work on Permagel, particularly in the lubricating grease field. With commercial production of Permagel about to be undertaken, Mr. Martin's considerable technical knowledge of the product and its applications should be very helpful to prospective users.

Mr. Martin holds a bachelor's degree in chemical engineering from the University of Pennsylvania, from which he was graduated in 1948. He is a member of the American Chemical Society and, commissioned as a lieutenant in the U. S. Navy Air Reserve, regularly flies carrier fighter craft under the Weekend Warrior program.

U. S. Steel Corp. Names Assistant Vice-Presidents

Appointments of Wilbur L. Lohrentz and Edward C. Myers as assistant vice-presidents in the industrial relations department of U. S. Steel were announced by George M. Thursby, vice-president, industrial relations administration. J. Warren Shaver, previously appointed to a comparable position, will continue as assistant vice-president and provide counsel and direction on matters pertaining to labor relations.

In the two newly created positions, Mr. Lohrentz will also provide counsel and direction on matters pertaining to labor relations, and Mr. Myers on matters pertaining to personnel.

A native of Chicago, Mr. Lohrentz was graduated from Denison University in 1934. He joined U. S. Steel in 1942 as assistant to secretary of Tubular Alloy Steel Corporation, an affiliate of National Tube Company located in Gary, Indiana, after practicing law in Chicago. He was named secretary of Tubular Alloy early in 1944 and when the company was merged with National Tube later that year, he was transferred to Pittsburgh where he was made assistant director of industrial relations for the Tube Company. He was made assistant to vice-president of industrial relations for U. S. Steel Corporation of Delaware in 1947 and held the same position with U. S. Steel Corporation at the time of his present appointment.

Mr. Myers was born in York, Pa., where he attended York public schools. He was graduated from Bucknell University in 1934. He began his career with U. S. Steel in 1934 as safety observer for Carnegie-Illinois at Homestead Works. He became plant director of personnel and training in 1937 and the following year was transferred to the U. S. Steel Corporation of Delaware as staff assistant in the public relations department. In 1942 he was named assistant director of public relations and in 1943, was transferred to the industrial relations department of the Delaware Corporation as assistant to vice-president. At the time of his appointment, he was serving in the same capacity for U. S. Steel Corporation.

Mr. Shaver, a native of Johnstown, Pa., was graduated from the University of Pittsburgh in 1933. He entered the electrical business in Johnstown and later returned to the University of Pittsburgh's Law School where he was graduated in 1942 with an LL.B. degree. After graduation, he was employed by the Peoples First National Bank and Trust Company of Pittsburgh as tax attorney. He joined U. S. Steel in 1944 and later was made assistant vice-president, industrial relations.

John Y. McCollister Joins Staff of United Petroleum

John Y. McCollister will become sales manager of the jobber sales division for United Petroleum Corporation. Mr. McCollister's father is John M. McCollister, vice-president in charge of sales for United Petroleum Corporation.

Mr. McCollister was formerly associated with International Business Machines Corporation as special representative to the meat packing industry. He had been with I. B. M. in Moline, Ill., Waterloo, Iowa, and Chicago for a little over seven years in various sales positions.

A veteran of World War II, Mr. McCollister served in the U. S. Navy as radar officer aboard the U. S. S. Birmingham in the Western and Southern Pacific. He received approximately one-year's post graduate training at Harvard University and Massachusetts Institute of Technology in preparation for his radar assignment. He is a 1943 graduate of the State University of Iowa.

Mr. McCollister succeeds his father as NLGI company representative for United Petroleum Corporation.

Harry Kaplan Retires

Harry Kaplan retired recently after 35 years of service as supervisor of the Grease Production Plant of The Atlantic Refining Company. He was succeeded by Herbert R. Swing assisted by George N. Nichols.

John F. McGrogan continues as supervisor of lubricating grease research and development activities.



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L. W. McLennan Completes 25 Years with Union Oil Co.

On June 15, 1953, L. W. McLennan completed his 25th year in the service of Union Oil Company of California. During this entire service period, he has been in the research and process department now housed in the company's new research center at Brea, California. Mr. McLennan entered the company's service in 1928 as a research chemist, and in 1943 was appointed as supervisor of all research on grease manufacture. In 1952, he was appointed assistant to the manager of research, and in July 1953, was appointed administrative supervisor for the department, the position he now holds. He has been associated with grease research for a period of 21 years.

Mr. McLennan was born in Canada and became a naturalized citizen of the U. S. A. in 1932. He received his education in universities in Canada, England, and the United States. Prior to joining Union Oil Company, he was associated with Koppers Company in 1925-1927, and the University of California in 1927-1928. He has been closely associated with the affairs of NLGI since 1943, and has been an NLGI director since 1949.

U. S. Steel Corp. Elects Blough as General Counsel

Roger M. Blough, vice chairman of the board of directors, United States Steel Corporation, has been elected general counsel by the directors, it was announced by Benjamin F. Fairless, chairman. He succeeds Nathan L. Miller, who died recently.

Mr. Blough will continue as vice chairman of the board, an office he has held since May of 1952. He is a member of the corporation's finance committee, as well as a member of its board of directors.

Following graduation from Yale Law School in 1931, Mr. Blough engaged in the practice of law with the firm of White and Case in New York City. His association with United States Steel commenced during the investigation of the steel industry by the temporary National Economic Committee in 1939 and 1940, when he served as an associate counsel for the corporation.

Mr. Blough was appointed in 1942 general solicitor in charge of all legal

matters for the United States Steel Corporation of Delaware. In January, 1951, he became executive vice-president—law and secretary and was made a director of United States Steel Company, Pittsburgh, Pa., then the principal operating subsidiary. He served in this capacity until his election as vice chairman of the board of United States Steel Corporation.

Kenneth N. Warner Joins Emery Industries Staff

Emery Industries, Inc., announces the appointment of Dr. Kenneth N. Warner to its research department. According to Dr. Kadesch, research director, Dr. Warner will be associated with the new chemicals department under the leadership of Dr. C. G. Goebel.

Dr. Warner was formerly associated with National Aniline, B. F. Goodrich Company, and Armour & Company. With each he was engaged in research activities.

Following up his B. S. degree in chemistry from Iowa State College, Dr. Warner obtained eight years experience in industry before obtaining his Ph. D in chemistry at the University of Wisconsin. He is a member of the American Chemical Society, Sigma Xi, Phi Mu Alpha and Phi Lambda Upsilon.

Walter H. Ware Retires From Socony-Vacuum

Walter H. Ware, manager of the Lubrite marketing division, Socony-Vacuum Oil Company, Inc., retired July 31. J. Harold Meyers, Lubrite division sales manager, succeeds Mr. Ware as division manager. The Lubrite division, with headquarters in St. Louis, markets Socony-Vacuum products in parts of Tennessee, Missouri, Illinois, Indiana and Ohio.

Mr. Ware started his career in the oil business in 1923 with the Lubrite Refining Corporation, which later became part of the Socony-Vacuum organization. He assumed his present position in 1947. Mr. Meyers has 24 years of service with the company.

Before the average American car is scrapped, it will have consumed 8,000 gallons of gasoline and run up $588 in gasoline taxes.

K. K. Boyd Becomes An Emery Vice-President



K. K. BOYD

Formerly director of sales and purchases, K. K. Boyd was recently elected to the newly created post of vice-president in charge of sales and purchases.

According to J. J. Emery, president of Emery Industries, Inc., this new position is the direct result of expanded activities which have led to broader problems of marketing the company's output.

Mr. Boyd has been with Emery for the past 18 years. Starting as a marketing specialist, he assumed charge of all purchases, including the buying of the fats which are Emery's principal raw materials. Subsequently he became director of purchases and sales, and was elected first a director and later secretary of the company.

Mr. Boyd holds an M. S. Degree from Iowa State College at Ames, Iowa. He came to Cincinnati in 1936 after a teaching career in Iowa schools.

Currently, he is very active as a member of the steering committee of the Fatty Acid Division of the Association of American Soap and Glycerine Producers.

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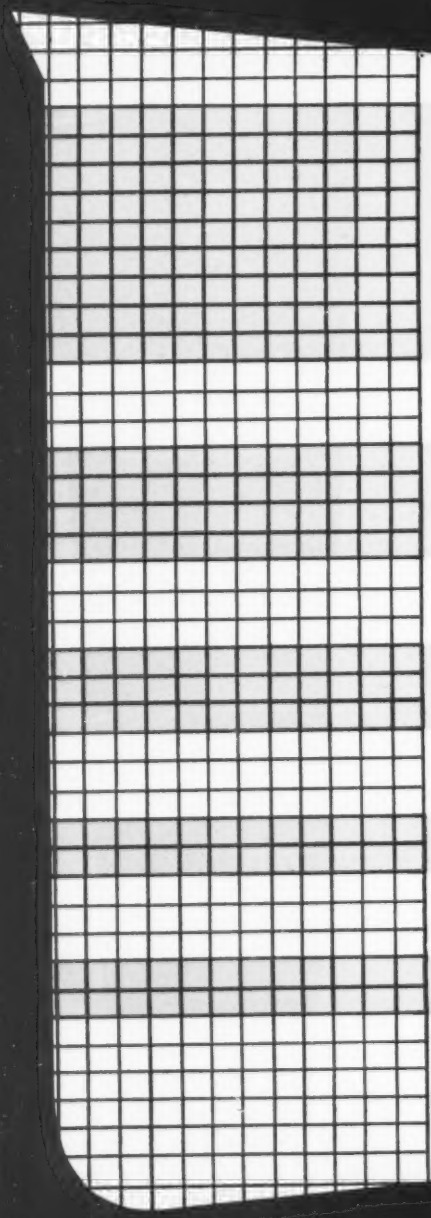
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Industry NEWS

ASTM Accepts 63 New Specifications

At the 1953 Annual Meeting of the American Society for Testing Materials, held June 28 to July 3 at Atlantic City, 72 of the Society's technical committees reported, with the result that 63 new specifications and tests were approved. All of these new tentatives will be published later in the year in the 1953 Supplement to the Book of ASTM Standards.

Copies of all new ASTM specifications will be available at a later date from ASTM Headquarters, 1916 Race Street, Philadelphia 3, Pa., at a nominal charge, usually 25 cents each, but slightly higher on standards over 16 pages. Tests of interest to NLGI members are listed below:

Petroleum Products and Lubricants (D-2)

Methods of:

Test for Effect of Grease on Copper (D 1261-53 T).

Test for Lead in New and Used Greases (D 1262-53 T).

Test for Leakage Tendencies of Automotive Wheel Bearing Grease (D 1263-53 T).

Test for Water Washout Characteristics of Lubricating Greases (D 1264-53 T).

Continental Can Buys Stock

Continental Can Company, in a step to round out its diversification in the packaging field, purchased all the outstanding stock of the Ehner E. Mills Corporation, of Chicago, it was announced by General Lucius D. Clay, chairman of the board of Continental.

The Mills Company, producer of plastic products including flexible bottles, tubes, and pipe and tubing, has one plant in Chicago which will continue to operate under the supervision and direction of Mr. Mills.

Metasap Offers Chart

A handy new chart has been prepared by Metasap Chemical Company, describing its complete line of stearates and their properties and applications.

Designed to be hung up in office or plant, the durable chart is available free by writing Metasap Chemical Company, Dept. 72, Harrison, N. J.

Foote Forms Public and Industrial Relations Department



Left to right, R. D. Drake, director of public and industrial relations, R. R. Gorham, personnel manager, and R. Coleman, Jr., editor of "Foote Notes," a publication directed to Foote employees, hold an informal conference.

Foote Mineral Company, specialists in industrial ores and chemicals, recently announced the formation of a public and industrial relations department.

The new department which will unify and coordinate public relations and personnel policies at the company level, is headed by Robert D. Drake. Robert Gorham is personnel manager and Charles Marsh is assistant personnel manager.

Each plant, laboratory, or office, also has a personnel assistant who is responsible for personnel activities in that area.

To assist the new department in its tasks, a committee on personnel has also been established. Objectives of this committee are to develop and recommend policies on all phases of employee relations such as: Recruiting employees, employment procedures and practices, employee indoctrination, wage and salary structures, bonus plans, management-employee communications, on the job training, employee benefits, job classifications, safety and welfare, recreation, job advancement, and external education.

The committee meets quarterly to discuss employee problems, and to plan programs to improve employee relations. Mr. Drake is chairman and Mr. Gorham is secretary of this committee.

Stresen-Reuter Quotes New Price

Fred'k A. Stresen-Reuter, Inc., Chicago supplier of ingredients for grease and other lubricants, has reduced the price of E. P. Lead Naphthenate 30% from 16½ cents to 16 cents per pound f.o.b. Chicago until further notice. This material is used widely in the formulation of extreme pressure greases.

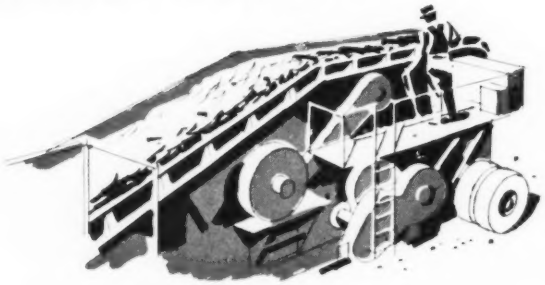
In addition to naphthenates, Stresen-Reuter is also a Midwestern source for octoates, linoleates and oleates. This company maintains complete research facilities at both Chicago and Bensenville, Illinois, plants.

GREATER RESISTANCE TO MECHANICAL BREAKDOWN

in aluminum greases

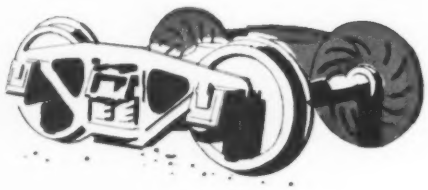
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In addition to excellent yield and unusually high gel stability, CYANAMID Gelling Agents for aluminum greases give greater resistance to mechanical breakdown.

These benefits are the result of an exclusive CYANAMID process which replaces a small amount of the stearic acid with dimer acid (dimerized linoleic acid), giving CYANAMID Gelling Agents a gel stability far greater than that of aluminum stearate itself.

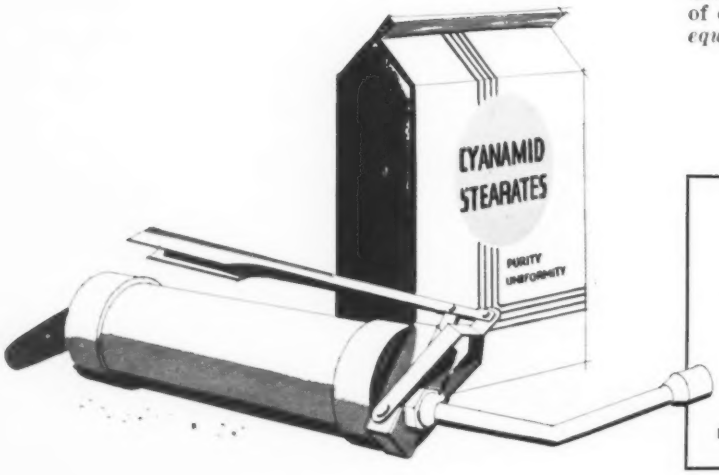


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Government-Owned Inventions Available For License

To encourage industry—particularly smaller plants—to take advantage of the fruits of Government-financed research, the U. S. Department of Commerce, in cooperation with the Government Patents Board, has made available in practical form information relating to 3658 Government-owned patents.

The information is in a book entitled, "Government-Owned Inventions Available for License," just published by the Commerce Department so that greater productive use might be made of the scientific and technological advances brought about at Government expense.

This 168-page book was prepared by the technical staff in the Office of the Chairman of the Government Patents Board. In a brief description of the publication, Dr. Archie M. Palmer, chairman of the Government Patents Board, indicated its practical value to American business.

He stated that the information contained in this book, drawn from the records of the Index of Inventions, which has been established and is maintained in his office, covers 3658 inventions which are wholly-owned by the Government. He explained that the other 16,000 inventions included in the total of nearly 20,000 recorded in the index are not owned outright by the Government but are under license to the Government for its own use, or for the use of others producing for the Government.

In describing the publication, Dr. Palmer said: "The publication not only provides the means of selecting patents which are immediately applicable and useful to American manufacturers but may also be a stimulating and diversified source of new ideas leading to the solution of research and manufacturing problems."

Dr. Palmer said that the 3658 Government-owned inventions are ordinarily available to the public on a nonexclusive, royalty-free license basis. These inventions embrace a wide variety of new products and processes, raw-material uses, additional techniques for producing already known results, and advances made in methods and processes. Many of the inventions require a minimum of technical development.

The inventions are arranged by fields of industrial use to facilitate the location of the patent or patents which may meet special needs, and are classified under 20 major industrial groups which are further divided into 211 subgroups.



Abstracts have been made of all the inventions listed in the new publication. They briefly tell what the invention is, what it does, and how it works. These abstracts are available for examination and use by the public in the Index of Inventions, in the field offices and some of the cooperative offices of the Department of Commerce and in the field offices of the newly established Small Business Administration.

"Government-Owned Inventions Available for License" may be purchased at the field offices of the Department of Commerce or directly from the Government Printing Office, Washington 25, D.C., for $1.00 a copy.

The new book supersedes "Government-Owned Inventions for Free Use," published in 1951, which has been completely reorganized, brought up to date and improved to make it easier and more practical to use.

Deep Rock Begins Operation Of Solvent Lube Oil Plant

A new $2,500,000 solvent lubricating oil plant has been put into operation at Deep Rock Oil Corporation's refinery at Cushing, Okla., officials have disclosed.

The plant is the latest in a sizeable expansion program for the refinery. Other major projects completed since the expansion was launched in 1949 include a catalytic cracking unit, a new crude unit, and a streamlined blending and packaging plant.

Not only have the new units modernized the plant and improved the quality of products, but daily crude oil intake has been increased from 12,400 barrels in 1948 to the recent rate of 19,000 barrels.

Test runs have been completed and the modern solvent lubricating oil plant is "on stream." The new units use phenol and propane as the treating agents for oil. Previously, sulphuric acid was used.

The solvent plant is located on the refinery grounds, two miles north of the city of Cushing.

It was designed and constructed by The M. W. Kellogg Co. The Refinery Engineering Co., built auxiliary facilities such as tankage, a water cooling tower and other off-site units.

A feature of the plant is automatic control of all phases of operation.

The new plant is capable of turning out hundreds of thousands of barrels of finished oils annually, including all grades of motor oils, numerous industrial oils, special products and the company's special "G" stock which is used by Deep Rock and others to make gear oil and greases.

In building a new solvent plant, Deep Rock said it is anticipating a higher demand for top quality lubricating oils in the years ahead. The new plant will permit Deep Rock to use the latest refining techniques to produce top quality oils. These oils are sold to compounders, refineries, marketers and lubricating grease manufacturers throughout the United States and under the Deep Rock brand.

From crude oil to finished product, careful checks are maintained by an experienced staff of research engineers and chemists at the Deep Rock refinery laboratory. More than 200 control tests are made by the company during each 24-hour period.



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- A strong bond between lubricant and metal surfaces
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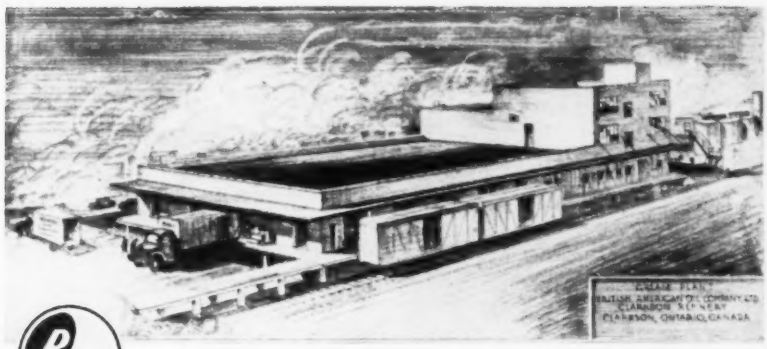
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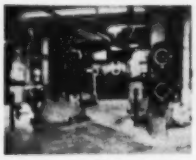
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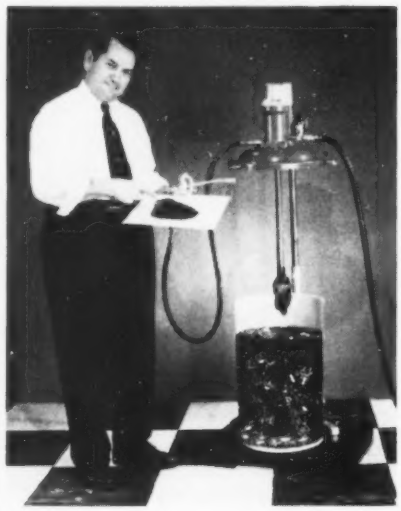
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Balcrank Pump Delivers Clean, Filtered Grease



E. D. Fox, service manager, Balcrank, Inc., Cincinnati, Ohio, demonstrates the exclusive nonfouling feature of the Balcrank Jet-Power Pump. A drum of grease was loaded with thousands of particles of road dust, sand and gravel; floor sweepings, steel filings, nuts, screws and bolts; broken glass and bottle caps; cigar and cigarette butts. Mr. Fox then pulled the trigger on the grease gun to produce an uninterrupted delivery of clean, filtered grease. The drum was then cut in half to reveal the defiled grease. Mr. Fox says of his job as Balcrank service manager: "It's easy. No service is required on a Balcrank Jet-Power Pump. But these demonstrations certainly keep me on the go. But seeing is believing. My job today puts the 'see' into service and eliminates the 'vice' of repairs. For nothing stops a Balcrank Jet-Power Pump."

API Creates Committee To Develop Symposium

Creation of a special committee to develop a symposium on the measuring, sampling and testing of crude oil and petroleum products was announced by the American Petroleum Institute.

The committee will hold its first meeting in St. Louis, September 21-22, to lay the groundwork for the symposium which will be held at the institute's 34th annual meeting in Chicago, November 1954.

The symposium was proposed by the advisory committee of the committee on API code 25, because of the need to correlate and publicize data on the measuring, sampling and testing of crude oil and petroleum products. The subject is of interest and great importance to all branches of the petroleum industry.

The purpose of the symposium is "to set forth for all concerned the impact that procedures of measuring, sampling and testing of crude oil and petroleum products have on their several operations and the consequent great practical significance this type of work has on the purchase, sale and transportation of crude oil and petroleum products."

The scope of the symposium will embrace container calibration, gauging, metering, temperature determinations, sampling and testing methods and instruments in both field and laboratory.

Cornerstone Laid During Inter-State's Sales Meeting

July 9th and 10th were the dates of the annual sales meeting of the Inter-State Oil Company. Sales personnel from an eight-state area assembled in the large meeting room of the company's new building at 250 South Fifth Street, Kansas City, Kansas, for the two-day session. Highlighting the ceremonies was the formal cornerstone-laying of the new plant, built to replace the company's old building at 87 Shawnee Avenue, demolished by the 1951 flood. There was also a brief ceremony in memory of Cervantes A. Shepard, Jr., former president of the company, who was killed in an automobile accident in February.

Outside speakers at the meetings included W. Lee Spencer, Los Angeles, California, manager of refinery sales for Union Oil Company, Mr. L. B. Trellue, Newark, N. J., Eastern division sales manager, Union Oil Company, and Tom J. Killeen, Chicago, Illinois, regional sales manager for Union Oil Company. Inter-State Oil Company is distributor for the Midwest area for Royal Triton Motor Oil, a product of Union Oil Company. R. L. Watts, Newark, N. J., manager of the Lubriplate division of Fiske Brothers Refining Company and Wade Carter, Omaha, Nebraska, district sales manager for Lubriplate were also featured on the program. Inter-State Oil Company is the Midwestern distributor for Lubriplate.

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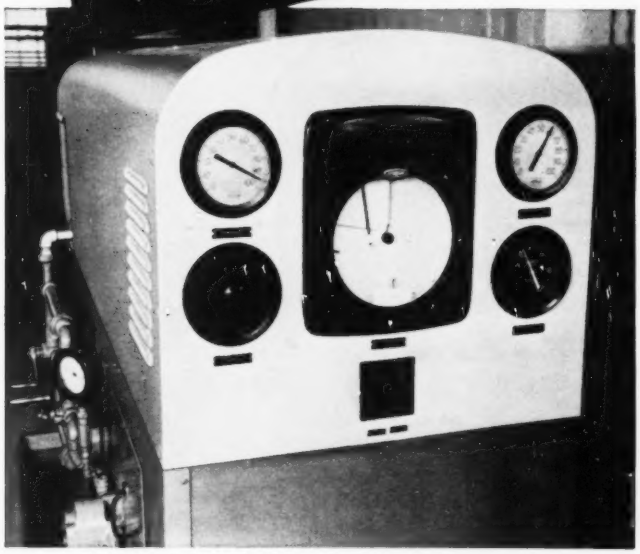
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Moisture	2% max.
Unsaponifiable (Wool Grease Alcohols)	6% max.
Saponifiable	94%
Free Fatty Acid (as oleic)	55-60%
Actual Free Fatty Acid Content	90%
Saponification No.	120-130
Free Inorganic Acid	0.2% max.
Iodine Value	20-40
Apparent Solidification Point (titre)	Approx. 44° C.
Softening Point	45-48° C.
% Sulfur	No corrosive sulfur

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What's more, Permagel is absolutely uniform from shipment to shipment, practically insuring grease reproducibility. It lends itself well to the continuous production of grease at high capacity. It permits you to select the surfactant best suited to your own needs, thus opening the way to better grease, at lower cost, with wider process flexibility.

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FUTURE MEETINGS of the Industry

SEPTEMBER, 1953

13-16 American Inst. of Chemical Engineers, Fairmont and Mark Hopkins Hotels, San Francisco, Calif.

14-17 Society of Automotive Engineers (national tractor meeting and production forum), Schroeder Hotel, Milwaukee, Wis.

15-16 American Petroleum Institute (executive committee), Greenbrier Hotel, White Sulphur Springs, W. Va.

16 American Petroleum Institute (Division of Marketing, Lubrication Committee meeting), The Traymore, Atlantic City, N. J.

16-18 National Petroleum Assn. (51st annual meeting), The Traymore, Atlantic City, N. J.

21-23 American Trade Assn. Executives (annual meeting), Chalfonte-Haddon Hall, Atlantic City, N. J.

24-25 Western Petroleum Refiners Assn. (regional meeting), Henning Hotel, Casper, Wyo.

27-29 National Assn. of Oil Equipment Jobbers (annual meeting), Neil House, Columbus, Ohio.

27 to Oct. 2 American Society for Testing Materials (Committee D-2 on Petroleum Products and Lubricants), Shoreham Hotel, Washington, D. C.

29 to Oct. 3 Society of Automotive Engineers (national aeronautic meeting), Statler Hotel, Los Angeles, Calif.

OCTOBER, 1953

4-6 American Assn. of Oilwell Drilling Contractors, Denver, Colo.

5-7 Texas Mid-Continent Oil and Gas Assn. (34th annual meeting), Rice Hotel, Houston, Texas.

7-9 National Assn. of Corrosion Engineers, South Central Region (annual meeting), Mayo Hotel, Tulsa, Okla.

8 Virginia Oil Jobbers Assn. (fall convention), Roanoke Hotel, Roanoke, Va.

9 Virginia Oil Men's Assn. (fall convention), Roanoke Hotel, Roanoke, Va.

11-17 Oil Progress Week.

14-15 Indiana Independent Petroleum Assn. (fall convention), Severin Hotel, Indianapolis, Ind.

15-16 Petroleum Marketers Assn. of Texas (annual meeting), Adolphus Hotel, Dallas Texas.

19-20 Independent Petroleum Assn. of America (annual meeting), Texas Hotel, Ft. Worth, Texas.

19-23 National Safety Council, Conrad Hilton, Congress, Morrison, Sheraton, Chicago, Ill.

22-23 Western Petroleum Refiners Assn. (regional meeting), Garrett Hotel, Eldorado, Ark.

25-27 Pennsylvania Petroleum Assn. (fall convention), Pocono Manor, Pocono Manor, Pa.

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FUTURE MEETINGS

OCTOBER, 1953

26-28 National Lubricating Grease Institute (21st annual meeting), Edgewater Beach Hotel, Chicago, Ill.

28-29 Independent Oil Compounders Assn. (6th annual meeting), Edgewater Beach Hotel, Chicago, Ill.

29-30 Society of Automotive Engineers (international production meeting), Royal York Hotel, Toronto, Ontario, Canada.

NOVEMBER, 1953

2-4 Society of Automotive Engineers (national transportation meeting), Conrad Hilton Hotel, Chicago, Ill.

2-4 American Oil Chemists' Socy. (27th fall meeting), Sherman Hotel, Chicago, Ill.

3-4 Society of Automotive Engineers (national diesel engine meeting), Conrad Hilton Hotel, Chicago, Ill.

4-5 Nebraska Petroleum Marketers (annual convention), Paxton Hotel, Omaha, Nebr.

5-6 Society of Automotive Engineers (national fuels and lubricants meeting), Conrad Hilton Hotel, Chicago, Ill.

9-11 The Geological Society of America (annual meeting), Royal York Hotel, Toronto, Ontario, Canada.

9-12 American Petroleum Institute (33rd annual meeting), Conrad Hilton Hotel and Palmer House, Chicago, Ill.

29-Dec. 4 American Society of Chemical Engineers (annual meeting), Statler Hotel, New York, N. Y.



30 to Dec. 5 — Twenty-fourth Exposition of Chemical Industries, Grand Central Palace, New York, N.Y.

DECEMBER, 1953

13-16 American Inst. of Chemical Engineers (annual meeting), Jefferson Hotel, St. Louis, Mo.

JANUARY, 1954

11-15 Society of Automotive Engineers (annual meeting and engineering display), Sheraton-Cadillac and Statler Hotels, Detroit, Mich.

FEBRUARY, 1954

8-10 Missouri Petroleum Assn. (annual convention), Chase Hotel, St. Louis, Mo.

15-17 American Petroleum Institute (Lubrication Committee), Sheraton-Cadillac Hotel, Detroit, Mich.

17-18 Iowa Independent Oil Jobbers Assn., Fort Des Moines Hotel, Des Moines, Iowa.

MARCH, 1954

1-5 American Society for Testing Materials (spring meeting), Shoreham Hotel, Washington, D. C.

2-4 Society of Automotive Engineers (national passenger car, body, and materials meeting), Hotel Statler, Detroit, Michigan.

3-5 American Petroleum Institute (Division of Production, Southwestern District), Rice Hotel, Houston, Tex.

8-10 American Inst. of Chemical Engineers, Statler Hotel, Washington, D. C.

17-19 American Petroleum Institute (Division of Production, Mid-Continent District), Skirvin Hotel, Oklahoma City, Okla.

APRIL, 1954

12-15 Society of Automotive Engineers (national aeronautical meeting, aircraft engineering display, and aircraft production forum), Hotel Statler, New York, N. Y.

MAY, 1954

2-4 Independent Petroleum Assn. of America (midyear meeting), Cosmopolitan Hotel, Denver, Colo.

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4 Max.	Acid Number	172-182
177-181	Saponification Value	182-187
3 Max.	Iodine Value	4 Max.
155 Min.	Hydroxyl Value	147 Min.
138 Min.	Acetyl Value	133 Min.

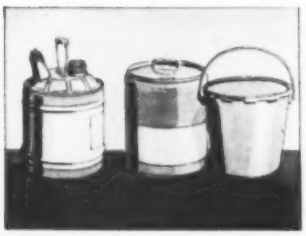
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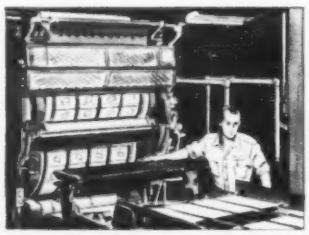


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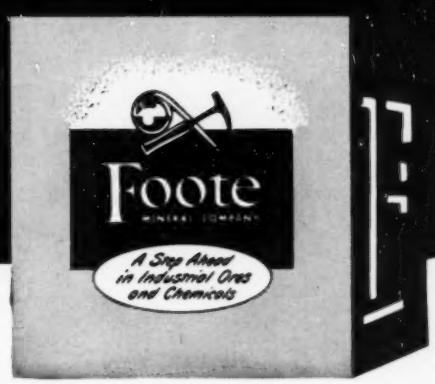
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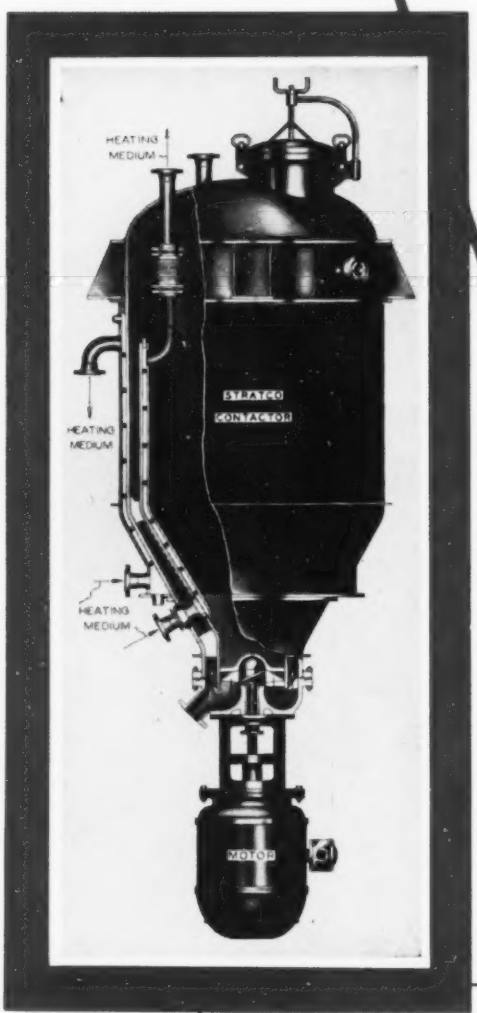
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